

**SYSTEM FOR PREPARING HIGH SCHOOL LEARNERS  
AND STUDENTS FOR SELF-EDUCATION**

**Sistema de preparación de los estudiantes para autoaprendizaje**

**Guntis Rudzitis,**

Latvian University of Agriculture, Ielgava, Latvia,

rector@inka.cs.llu.lv

**Abstract**

The author presents a system of advice on how to promote student self-learning.. This aim can be reached by using specially prepared didactic material, specific recommendations for intellectual work, and by using general methods and techniques of self-education in independent student work .

Keywords: self-education, teaching, learning

**Resumen**

En el trabajo está presentado el sistema de preparación de los estudiantes de la escuela secundaria (bachillerato) y escuela superior para aprender los metodos del trabajo independiente. Para alcanzar los propositos de este es necesario la utilización de los materiales didácticos , preparados especialmente, el cumplimiento de las recomendaciones especiales para el trabajo intelectual, los conocimientos de los métodos y tecnicas generales del autoaprendizaje para el trabajo independiente y la realización de tareas.

Palabras clave: autoaprendizaje, enseñanza, aprendizaje

## Introduction

The main problem for teachers at secondary school and universities in the world is how to promote learning in the young generation. Teachers should help young people to be prepared for independent work and for their shift to self-education in the field of intellectual work and its rationalization. The definitions of these terms were formulated 30 years ago and were printed in some encyclopaedias : "Independent work could be seen in pupils and students various individual and collective independent activities in lessons, lectures, consultations and tests as well as at home without direct participation of an instructor but taking into account his/her directions, instructions or recommendations" (Gimenes enciklopedija, 1989; Rudzitis, 1977).

Self-education is a systematic cognitive activity defined, planned, and led personally with the aim to develop knowledge and skills. It is possible to carry out self-education both in educational institutions and outside. Self-education promotes self-upbringing, but successful self-education is not possible without the last one. (Rudzitis, 1991).

The successful preparation of young people for self-education can be achieved by means of three joined and coordinated elements which provide the development of specific and general knowledge and the skills necessary in independent and self-educating work .

In the first element of the system, the main component is the preparation of a new kind of didactic materials and text-books with the purpose to develop independent work and self-educating skills. The most important structural parts or general didactic elements of the textbooks are shown briefly in table 2..(Arets, 1961; Rudzitis, 1991; Rudzitis, 1993).

## General didactic basic principles

### of textbooks

<ol style="list-style-type: none"><li>1. To provide learners with special text-instructions on how to work with the book and methodological recommendations for independent studies, self-upbringing and preparing pupils for self-education.</li><li>2. To explain uniformity of learning material under a common plan.</li><li>3. The success of independent studies, acquiring the consolidation and the recapitulation of knowledge during lessons and consultations, as well as well prepared home tasks, is mainly predetermined by using tables, schemes, algorithms facilitating perception of the essential learning elements.</li><li>4. To use various prints, notes on the margins and special notes.</li><li>5. To use the special learning material about the Community by working with extra texts, schemes, illustrations and tasks over the course. That traditionally arises students interest toward the learning process.</li></ol>	<ol style="list-style-type: none"><li>6. Including material on interesting historical facts, illustrations and elements of humor to arise students the interest towards the learning process.</li><li>7. Working out questions, exercises and tasks and introducing these materials in the textbook for self-control of knowledge.</li><li>8. To apply the material which promotes the development of independent thinking processes and which helps students to use their knowledge in new circumstances.</li><li>9. It is necessary to write learning texts in easy, clear language but at the same time providing sufficient scientific foundations.</li><li>10. To design computerised textbooks.</li></ol>
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These basic principles have been applied to design Chemistry textbook for the Soviet and Russian secondary school ( Rudzitis, Feldman, 1998; Rudzitis, Feldman, 1999 ).

Let's shortly pay attention to the third basic principle. When the pupil opens a traditional textbook about chemical properties of hydrochloric acid he/she starts thinking about how boring this material with the formulas and equations is. To handle this situation appropriately the textbook should contain the carefully worked out special table (table 3), reflecting the common and specific chemical properties of hydrochloric acid.

Table 3.  
Properties of hydrochloric acid

Properties common to other acids	Specific Properties
1. To change colours of indicators  2. The interaction with metals: $2\text{HCl} + \text{Zn} \rightarrow \text{ZnCl}_2 + \text{H}_2$  3. The interaction with bases and intermediate oxides: $2\text{HCl} + \text{CaO} \rightarrow \text{CaCl}_2 + \text{H}_2\text{O}$  $2\text{HCl} + \text{ZnO} \rightarrow \text{ZnCl}_2 + \text{H}_2\text{O}$  4. The interaction with bases: $2\text{HCl} + \text{Cu}(\text{OH})_2 \rightarrow \text{CuCl}_2 + 2\text{H}_2\text{O}$  5. The interaction with salts: $2\text{HCl} + \text{CaCO}_3 \rightarrow \text{H}_2\text{O} + \text{CO}_2 + \text{CaCl}_2$	1. The interaction of HCl with silver nitrate (1):  $\text{HCl} + \text{AgNO}_3 \rightarrow \text{AgCl} + \text{HNO}_3$  2. The interaction of chlorides with silver nitrate (1): $\text{CaCl}_2 + 2\text{AgNO}_3 \rightarrow 2\text{AgCl} + \text{Ca}(\text{NO}_3)_2$

This compact presentation of important information may help the teacher improve the organization of this studying material during the class work.

The basic principle n 6 is very important because it allows the interest of students towards the learning process to increase with the material about interesting historical facts, elements of

humor, illustrations (table 2). It is often possible to print interesting materials which cannot be included in the basic text on the margins.

But now let's turn to the second element of the system (table 1). It concerns the necessity of the development of specific intellectual working skills. It is possible to give many examples of how to use this principle. For example, the teacher of foreign languages, polyglot J.Zolotorevsky knew approximately 30 languages. You may see the main components of his methodological recommendations for foreign languages studying and for the self-education in the next (table 4).

Table 4.

The methodological recommendations  
for studying foreign languages

1. The importance of knowledge of 2d, 3d .. foreign languages.
2. Developing spoken language skills.
3. Rational usage of textbooks.
4. Ways of learning new words.
5. Use of dictionaries.
6. Rational way of taking notes.
7. Rational ways of comprehending texts independently and retelling them.
8. Making narrations using illustrations.
9. Making narrations about future profession and hobbies.
10. Using reference literature (encyclopedias, hand-books).
11. Studies of grammar material in connection with the corresponding study material.
12. Use audio and video records.
13. Skills development of writing compositions (choice of a theme, making a plan, ways of writing drafts and final copies).
14. Independent preparing for lessons and consultations.
15. Development of independent work for tests.
16. Independent and self-educating work of young people preparing for a foreign language exam.
17. Some examples of self-education work plans for foreign languages studies.

In every theme J.Zolotorevsky had to help his pupils with the special pedagogical

recommendations and didactic materials and showed the most effective ways for rational independent work and self-education. He worked some pedagogical recommendations for these themes. Let's consider one fragment from ways of studying new words offered by him.

"If a person has a desire to learn a foreign language it is really possible even to be engaged 16-18 hours a day. Each person uses the transport nowadays.

He takes his place and looks at the window purposelessly sitting comfortably in a bus or trolley-bus. Valuable minutes spent on the way disappeared. Nobody will give them back during one's life. But the brainy person will act differently. He cuts out 3 by 4 cm papers and numerates them. Then he writes a sentence consisting of new words. The pronunciation and translation into native language is written on the other side of the paper. A week's quota to study could be 30 pieces of paper. They are pinned together and put in the pocket. Using transport services going to school or to work one can take out coupons and look at each of them. One can repeat it several times a day. A week's quota could be 40 words. There are about 50 weeks per year, so 50 by 40 makes 2000 words, but people waste that time very often. The person needs to know only 2000 words to start reading popular brochures in a foreign language. One can use such chances. We only need desire. Even a driver who has a car, can switch on a tape-recorder and listen to special learning records in a foreign language".

J.Zolotarevsky wanted to print his methodical recommendations for every pupil, but he left us early. Such recommendations are needed for students in every subject, especially in Mathematics, Physics and Chemistry.

The third important element of the system ( table 1) is preparing students for acquiring general methods and techniques of self-education and self-upbringing in extracurricular lectures (Aret, 1961). The self-upbringing is the development of the positive characteristics of a person/ a group and the elimination of the negative ones. There is an important practical question there :

“How to find time for the third element during the calss work ?” To solve this problem some secondary schools and universities started to use such kind of activities as the thematic students meeting, optional lessons, lectures and activities of scientific student societies . Such kind of lessons for the senior grade pupils and students can be organized once a month.

There are some examples of themes of these activities on the table 5 .

Table 5.

### Rationalization of intellectual work and self-upbringing

- Huge possibilities of a persons mind activity.
- Memory and its mastering.
- Attention and its development.
- Upbringing of will and character.
- The most effective ways of thinking development.
- Mastering intellectual working abilities and talent is the result of serious systematic work.
- Growth of the person’s spiritual beauty.
- Creative activity of young people. Its goal oriented organization according to up dated science, technique and social life demands.

It would be useful to introduce a special subject or courses for students dedicated to these topics. These principles can be find in the special series of brochures being issued for pupils and students too, “How to work with a book”, “The system of preparing students for self-education”, “Preparing students for self upbringing”, “The role of will-power and character in the learning process”, “The ways of rational intellectual work”. (Rudzitis, 1996; Rudzitis, 1998).

It is possible to establish four self-education levels for pedagogical research work (table 6.). (Rudzitis, 1991; Rudzitis, 1997).

Table 6.

#### Four Levels of self education

- The first level is typical for students, who begin learning of self education principles. They do not have clear ideas about skills, ways and methods of intellectual work, which are necessary for reaching the aims of self education. Their self educational activities are not rational and systematic.
- The second level is typical for learners who master certain rational skills of intellectual work, but sometimes do not have the necessary abilities in self education and self upbringing work. The students on this level try to work out plans and schemes of self education, but traditionally do not carry them out.
- The third level is characteristic for people who master rational skills and methods of intellectual work, but lack some of the necessary abilities of self upbringing work, for systematic self education. They have plans and schemes of self education, but their achievement sometimes hard and without good results.
- The fourth level is typical for people who know rational skills and methods of systematic self education and self upbringing very well. At the same time they generate for themselves the necessary supplement knowledge and constantly develop their personality. They carry out plans and schemes of self education according to a certain plan.

The research data show that those youngsters lacking some teacher attention stay on the first level for a long period of time. Their self-education is interrupted or is carried out very slowly in many cases. Only the most diligent youngsters are successful in education without some pedagogical help. (Rudzitis, 1991).

In the case of the teacher providing systematic and goal-directed help in a longer period of time, for example two years, young people can master their ways of intellectual work and self-



upbringing both in lessons and out-of-class work. In this case their preparation for self-education increases significantly and it is possible to observe positive changes in self-education levels. In the same way, the number of young people in the student group whose work corresponds to the first level of self-education is decreasing.

The number of young people on the second and third levels is increasing at the same time, but some of the most persistent students can reach even the fourth level (Rudzitis, 1997; Rudzitis, 1998; Rudzitis, 1999).

## **Conclusions**

The important work of improving knowledge and abilities of students can give positive results by establishing the system of preparing students for self-education, based on writing new didactic materials, specific recommendations for intellectual work and general methods and techniques for self-education in the independent work of students .

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## **NOTA DE REDACCIÓN**

Profesor Guntis Rudzitis ( nacido en el año 1932) de Latvia, especialista muy conocido en el mundo de la metodología y didáctica de la ciencias naturales y Química. Sus libros del texto están publicados en varios idiomas. El número de copias de estos libros es aproximadamente 100 millones para el año 1999.